CLAIMS

1. A system for a dental filling material or an implant material, alternatively a system for bonding between a tooth or a bone and a dental filling material and a implant material, respectively, which system comprises a water based hydration liquid and a powdered material, the binder phase of which powdered material essentially consisting of a calcium based cement system, which powdered material has the capacity following saturation with the liquid reacting with the binder phase to hydrate to a chemically bonded ceramic material, characterised in that said powdered material and/or said hydration liquid comprises water soluble phosphate or a phase that has the capacity to form water soluble phosphate, whereby the system exhibits the capacity during hydration to form apatite.

2. A system according to claim 1, characterised in that the system has the capacity during hydration to form 0.01-30 % by volume apatite in the system.

3. A system according to claim 1, characterised in that the system is a bonding system that has the capacity during hydration to form 0.01-60 % by volume apatite in the system.

4. A system according to any one of the preceding claims, characterised in that the system has a pH of at least 7, preferably 7-12.5 and even more preferred 7-11, preferably by use of a buffering system of phosphates or carbonates e.g.

5. A system according to any one of the preceding claims, characterised in that the binder phase essentially consists of fine grain $3CaO \bullet Al_2O_3$ and/or $3CaO \bullet SiO_2$ and/or $2CaO \bullet SiO_2$, preferably having a mean particle size of at most 5 μm and even more preferred at most 1 μm, and in that the hydration liquid comprises phosphoric acid with tricalcium phosphate.

6. A powdered material, the binder phase of which essentially consisting of a calcium based cement system, which powdered material has the capacity following saturation with a liquid reacting with the binder phase to hydrate to a chemically bonded ceramic material, characterised in that the powdered material comprises water soluble phosphate or a phase that has the capacity to form water soluble phosphate, whereby the cement system exhibits the capacity

during hydration to form apatite.

7. A powdered material according to claim 6, characterised in that said calcium based cement system is a cement system in the group that consists of aluminates, silicates, phosphates, sulphates and combinations thereof, preferably aluminates.

8. A powdered material according to any one of claims 6-7, characterised in that said water soluble phosphate is an alkali phosphate.

9. A powdered material according to any one of claims 6-8, characterised in that it also comprises grains of a phosphate-containing phase, preferably hydroxy- or fluoride-apatite.

10. A powdered material according to any one of claims 6-9, characterised in that it also comprises high-molecular proteins, preferably collagen or elastin.

11. A powdered material according to any one of claims 6-10, characterised in that it also comprises a fluoride-containing phase of non difficultly soluble character, preferably in contents of from 0.5 % and up to 10 %.

12. A powdered material according to any one of claims 6-11, characterised in that it comprises carbonate or biologically existing ions that has the capacity to form calcite and/or aragonite, oxalates, lactates, citrates.

13. A powdered material according to any one of claims 6-12, characterised in that phosphate or phosphate-forming phase exists as particles that are precoated by a material comprising phosphate or phosphate-containing phase.

14. A powdered material according to any one of claims 6-12, characterised in that phosphate or phosphate-forming phase exists by the cement system comprising phosphate-containing phase in solid solution in the cement system.

15. A powdered material according to any one of claims 6-14, characterised in that the cement system is a bonding system that has the capacity during hydration to form 0.01-60 % by volume apatite in the system.

16. A powdered material according to claim 7, characterised in that said calcium based cement system is a bonding system that has a larger mole content of calcium than of aluminium, the cement system preferably comprising $3CaO \bullet Al_2O_3$.

17. A powdered material according to any one of claims 6-14, characterised in that the cement system has the capacity during hydration to form 0.01-30 % by volume apatite in the cement system.

18. A powdered material according to any one of claims 6-14 or 17, characterised in that it exists as a raw compact that preferably exhibits a degree of compaction of at least 55 % by volume solid phase, more preferred at least 60 % by volume solid phase, even more preferred at least 65 % by volume solid phase and most preferred of all at least 70 % by volume solid phase.

19. An aqueous hydration liquid for a powdered material, the binder phase of which essentially consisting of a calcium based cement system, which powdered material has the capacity following saturation with a liquid reacting with the binder phase to hydrate to a chemically bonded ceramic material, characterised in that the hydration liquid comprises water soluble phosphate or a phase that has the capacity to form water soluble phosphate, whereby the cement system exhibits the capacity during hydration to form apatite.

20. A hydration liquid according to claim 19, characterised in that said water soluble phosphate exists or has the capacity to be formed in an amount of at least 0.01-5 M, preferably 0.1-2 M and even more preferred 0.5-1.5 M.

21. A hydration liquid according to claim 19, characterised in that it is adapted for a bonding system, said water soluble phosphate existing or having the capacity to be formed in an amount of at least 0.01-5 M, preferably 0.5-4 M and even more preferred 1-3 M, suitably close to saturation.

22. A hydration liquid according to any one of claims 19-21, characterised in that said water soluble phosphate comprises phosphate ions in the group that consists of PO_4^{3-}, HPO_4^{2-}, $H_2PO_4^-$, hydro-ammonium phosphate and other phosphor-containing ions.

23. A hydration liquid according to any one of claims 19-22, characterised in that it has a pH of at least 7, preferably 7-12.5 and even more preferred 7-11, preferably by use of a buffering system of phosphates or carbonates e.g.

24. A hydration liquid according to any one of claims 19-23, characterised in that it comprises suspended or emulsified, non hydrated or partially hydrated calcium aluminate cement, for the formation of a basic environment for the apatite.

25. A hydration liquid according to any one of claims 19-24, characterised in that it comprises carbonate or biologically existing ions that has the capacity to form calcite and/or aragonite, oxalates, lactates, citrates.

26. A hydration liquid according to any one of claims 19-25, characterised in that it comprises fluoride ions, preferably at a concentration of 0.01-5 M, even more preferred 0.1-2 M and most preferred 0.5-1 M.

27. A hydration liquid according to any one of claims 19-25, characterised in that an accelerator and/or a superplasticizer.

28. An implant material comprising a substrate, characterised in that said substrate comprises a hydrated coating layer (2) of a system according to any one of claims 1-5.

29. An implant material according to claim 28, characterised in that the coating layer (2) exhibits a thickness of 0.5-20 μm, preferably less than 10 μm, and even more preferred 0.5-3 μm.

30. An implant material according to claim 28 or 29, characterised in that the coating layer (2) exhibits an outer layer (3) of a powdered material according to any one of claims 6-18, on top of it.

31. An implant material according to claim 30, characterised in that the outer layer (3) exhibits a thickness of 0.5-10 μm, preferably less than 5 μm, and even more preferred 0.5-3 μm.

32. An implant material according to any one of claims 28-31, characterised in that a crystal size in the layer (2, 3) is 5 μm at the most, preferably less than 1

μm.

33. A method of achieving bonding between a tooth or a bone and a dental filling material and an implant material, respectively, which dental filling/implant material comprises a chemically bonded ceramic material, characterised in that a bonding system according to any one of claims 1-5 is used.

34. A method according to claim 33, characterised in that a powdered material according to any one of claims 6-17 and/or a hydration liquid according to any one of claims 19-27, is used in the bonding system.

35. A method according to any one of claim 33 or 34, characterised in that the tooth or bone is pre-treated by etching with an etching agent and/or by mechanical coarsening techniques, micro-blasting e.g.

36. A method according to claim 35, characterised in that said etching agent comprises a phosphate-containing etching agent, preferably an etching agent in the group that consists of phosphoric acid, hydrophosphoric acid, phosphate buffer and citrates.

37. A method according to any one of claims 33-36, characterised in that the bonding system is applied onto the tooth or bone, preferably by painting or spraying, where after said dental filling/implant material is applied outside said bonding system.

38. A method according to claim 37, characterised in that said dental filling/implant material is chosen to be compatible with the bonding system, said dental filling material/implant material preferably comprising a powdered material, the binder phase of which essentially consisting of a calcium based cement system, which powdered material has the capacity following saturation with a hydration liquid reacting with the binder phase to hydrate to a chemically bonded ceramic material, said powdered material and/or said hydration liquid comprising water soluble phosphate or a phase that has the capacity to form water soluble phosphate, whereby the dental filling material/implant material exhibits the capacity during hydration to form apatite.